



Global Amphibians





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Research, education and supporting local communities to
conserve amphibians.



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Common frog



Common toad



Natterjack toad

Native British amphibians



Smooth newt



Palmate newt



Great crested newt

Common frog (*Rana temporaria*)

- Variable dorsal colour.
- 'Mask' behind the eye.
- Visible tympanum.
- Dorso-lateral fold distinct.
- Smooth skin.
- Usually have bands on back legs.
- Jump up to 1.5 metres.
- Males call in breeding season.



Breeding strategy

- Explosive breeding.
- Males arrive at breeding site first – call to attract females.
- Male forms amplexus with female.
- External fertilization.
- Clumps of spawn (one per female): 2-3 weeks to hatch.
- Tadpoles feed on algae, detritus and later carrion.
- Tadpoles metamorphose after 2-3 months.



Frog tadpole

Toad tadpole

Common toad (*Bufo bufo*)

- Dorsal surface usually dark brown/black and more uniform in colour.
- Dorso-lateral folds indistinct.
- Warty skin – toxic to predators.
- Crawl or short hops.
- Males make a ‘release’ call in breeding season.
- Males have nuptial pad on front feet.



Breeding strategy

- Highly explosive breeding.
- Males usually arrive at breeding site first.
- Male forms amplexus with female.
- External fertilization.
- Double strings of spawn: 2-3 weeks to hatch.
- Tadpoles feed on algae and detritus.
- Tadpoles metamorphose after 2-3 months.



- Tadpoles have toxic skin so able to avoid predation.



Natterjack toad (*Epidalea calamita*) formally *Bufo*

- Very rare – only found in a few locations.
- Smaller than common toads.
- Adults have yellow stripe down their back.
- Green/beige dorsal colour.
- Dorso-lateral folds absent.
- Warty skin.
- Run rather than crawl.
- Males have a high-pitched call.



Breeding strategy

- Protracted breeding.
- Males usually arrive at breeding site first.
- Males call to attract females.
- External fertilization.
- Single strings of spawn: 2-3 weeks to hatch.
- Tadpoles exhibit phenotypic plasticity in development ie. Metamorphose sooner if pond dries.



Typical common frog breeding sites



- May use temporary or permanent water bodies.
- Prefers water without large numbers of fish.

Typical common frog breeding sites

- Adults may return to breed in the same pond each year.



- Spawn clumps usually laid together.

Landscape conservation – common frog



- Adults generally sedentary – may not move further than 50 m from pond.
- Overwintering in pond is common.
- Juveniles disperse – find new ponds.
- Provision of ditches, hedgerows, and wild grass strips aid dispersal.
- Create ponds within 1 km without barriers.

Typical common toad breeding sites



Typical common toad breeding sites

- Typically prefer permanent water bodies.
- Tolerates large numbers of fish.
- Rarely at ponds for more than a week or so each year.



Landscape conservation – common toad

Over 95% of their time is spent on land.



Landscape conservation – common toad



- Migrate widely into terrestrial habitats.
- Habitual annual migrations.
- Often more than 1 km from ponds.
- Wildlife corridors essential for maintaining populations.



Landscape conservation – common toad



- Adults return to breeding ponds.
- Juveniles disperse widely into terrestrial habitats.
- Spring, summer and autumn migrations.
- Provision of suitable terrestrial habitats are crucial to facilitate dispersal.

Landscape conservation – common toad

Spring migrations



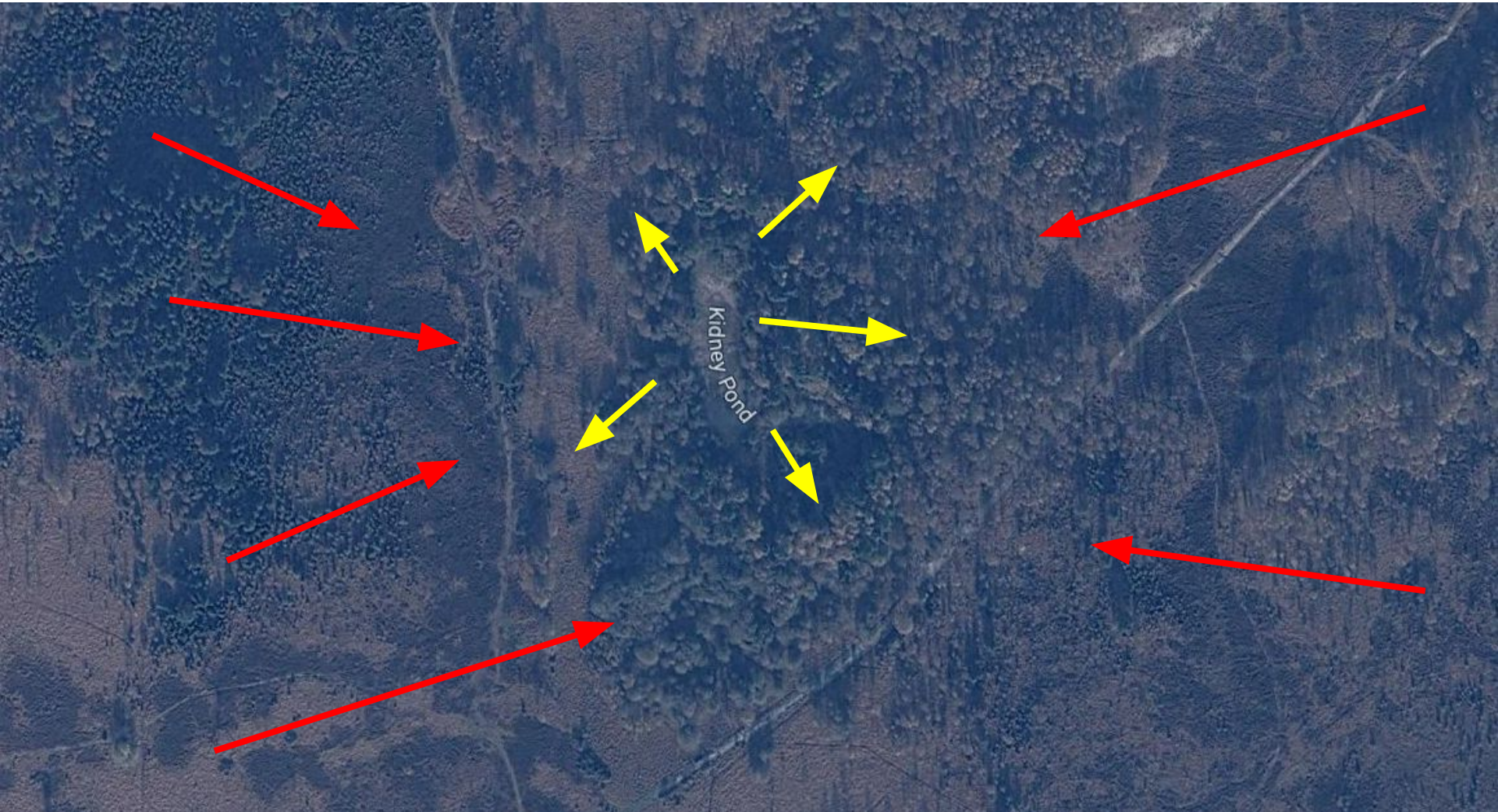
Landscape conservation – common toad

Summer movements



Landscape conservation – common toad

Autumn juvenile dispersal and adult migrations



Smooth newt (*Lissotriton vulgaris*) formally *Triturus*

- Males develop wavy crest which is continuous with tail in the breeding season.
- Males possess a swollen cloaca.
- Females dorsal varies brown/black: similar to palmate newt.
- Both sexes have brown, spotted throats.
- Ventral surface yellow/orange with distinct spots.



Palamte newt (*Lissotriton helveticus*) formally *Triturus*

- Males develop a filament to the tail, webbed back feet and ridge along back in breeding season.
- Males possess a swollen cloaca.
- Females similar to female smooth newt but face has more distinct black stripes.
- Both sexes have pale, pink throats.



Great crested newt (*Triturus cristatus*)

- Males develop a jagged crest which has a break before the tail and white tail stripe.
- Female dark dorsal surface.
- Granular skin: toxic to predators.
- Ventral surface yellow/orange with unique black blotches.



Breeding strategy

- Protracted breeding: February – June
- Males perform sexual display to attract females: waft tail and pheromones.
- Male deposit spermatophore on substrate.
- Female collects – internal fertilization: Larvae hatch after 2-3 weeks.
- Female lays 200-300 eggs, individually wrapping each within a leaf.
- Smooth/palmate larvae indistinguishable.



Typical smooth and palmate newt breeding sites



- Will use permanent or temporary water bodies.
- Do not tolerate large numbers of fish.
- Smooth newts often use garden ponds.
- Palmate newts prefer more acidic water bodies.



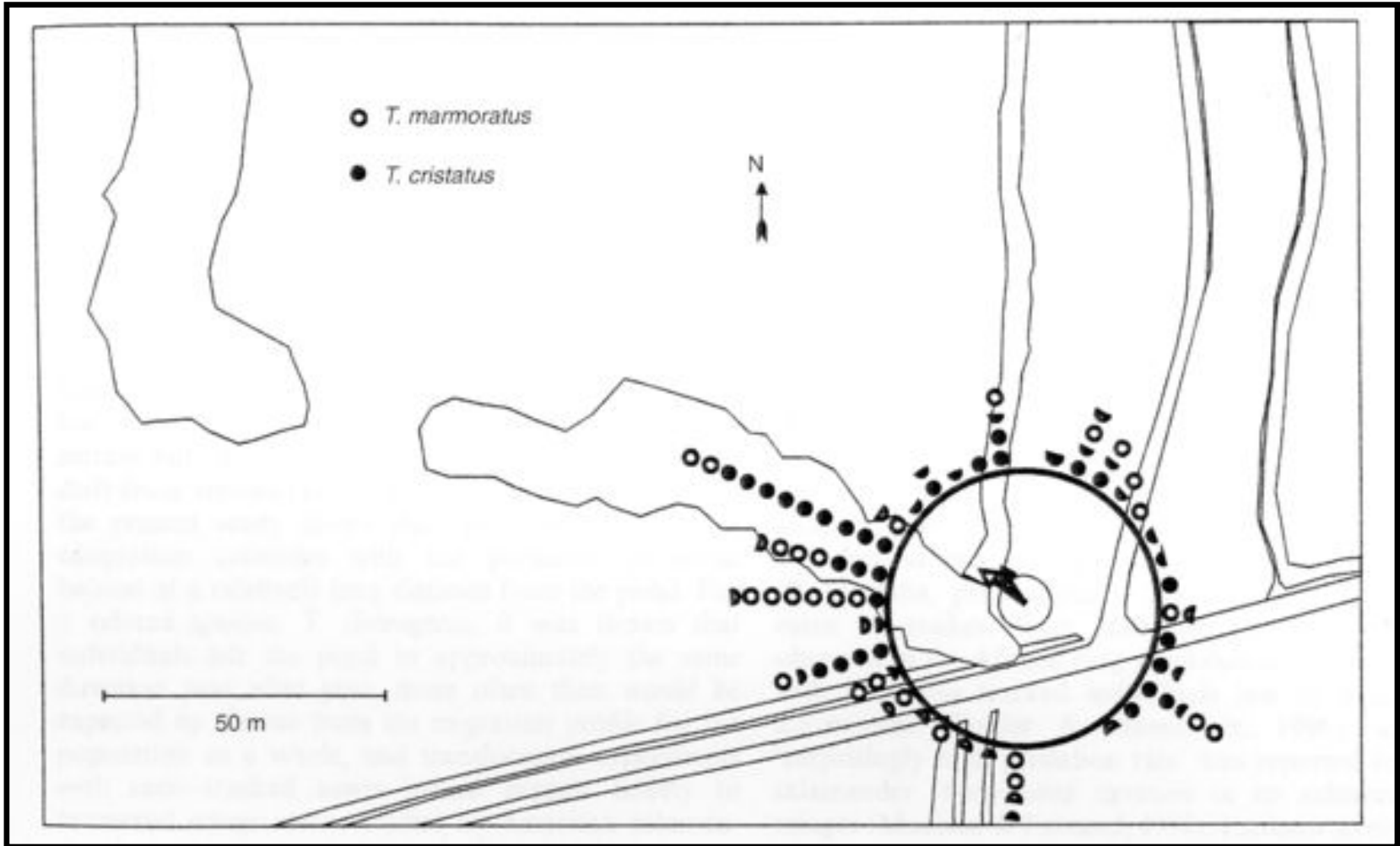
Typical great crested newt breeding sites

More exacting habitat requirements: (Oldham et al. 2000)

- 400 metres square or larger.
- Usually permanent or drying one year in 10.
- High water quality.
- No more than 60% shading.
- No fish.
- Few waterfowl.
- Ponds within 1 km.



Great crested newt dispersal

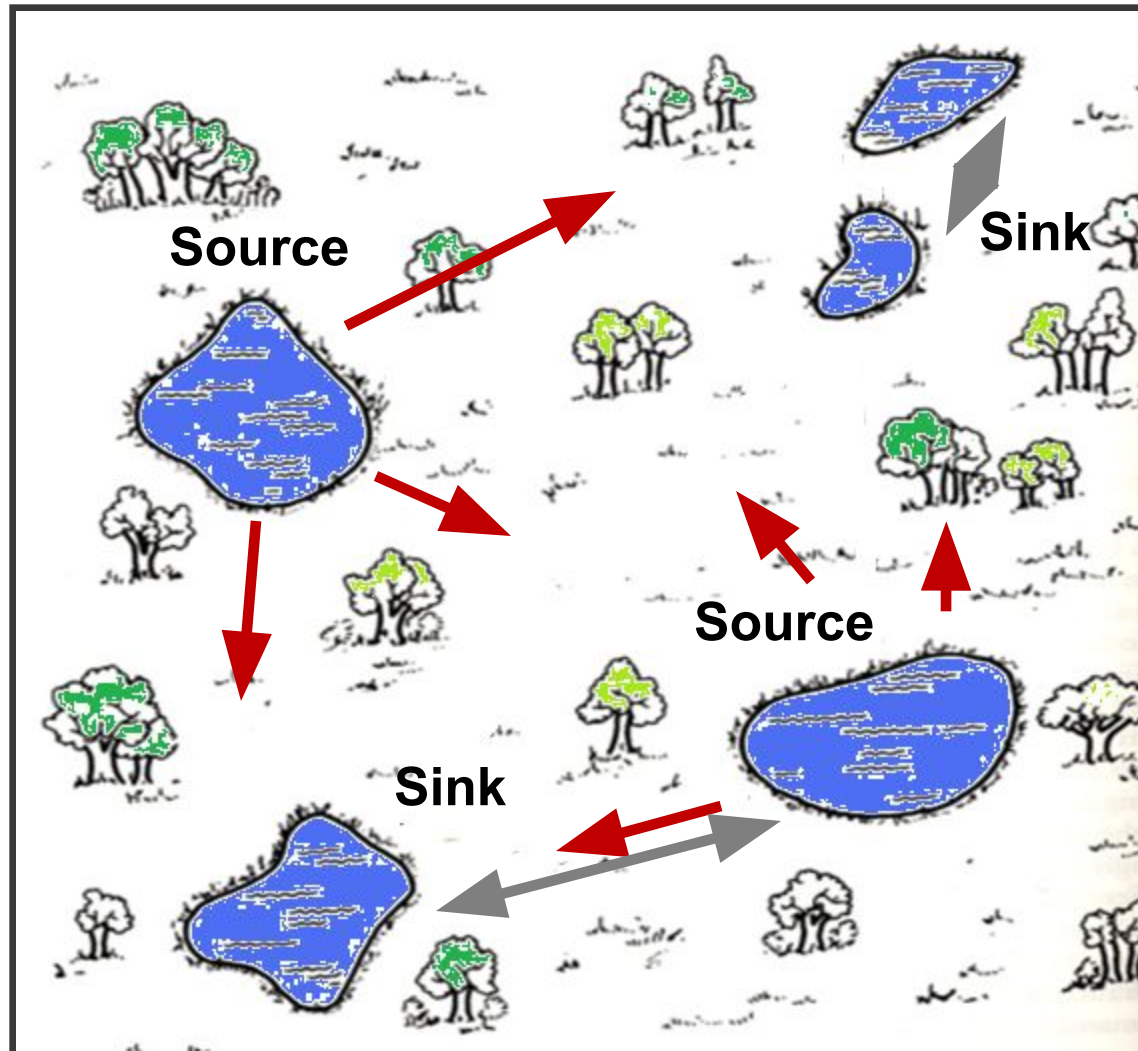


Source: Jehle, R. and Artzen, J. W. (2000) Post-breeding migrations of newts (*Triturus cristatus*) and (*T. marmoratus*) with contrasting ecological requirements. *Journal of Zoology, London*. **251**: 297 – 306.

Metapopulation ecology in the great crested newt

Source ponds have high juvenile recruitment

Sinks non-recruiting – often seen as less important



Great crested newt mitigation tunnels



Great crested newt mitigation tunnels

Case study: Monks Cross, York



Great crested newt mitigation tunnels

Case study: Monks Cross, York



Breeding newts delay York Monks Cross shop development

4 January 2013



Work was due to start on York's Monks Cross development in January but will now be delayed until the spring

Newts put the brakes on York shopping centre

8 JANUARY 2013 • BY LAURA MARK



1/4

A £90 million shopping centre project in York designed by DLA Architecture has stalled following the discovery of a growing population of newts

European Journal of Wildlife Research (2019) 65:27
<https://doi.org/10.1007/s10344-019-1263-9>

ORIGINAL ARTICLE



Road mitigation using tunnels and fences promotes site connectivity and population expansion for a protected amphibian

Laurence E Jarvis¹ · Michael Hartup¹ · Silviu O Petrovan^{1,2}

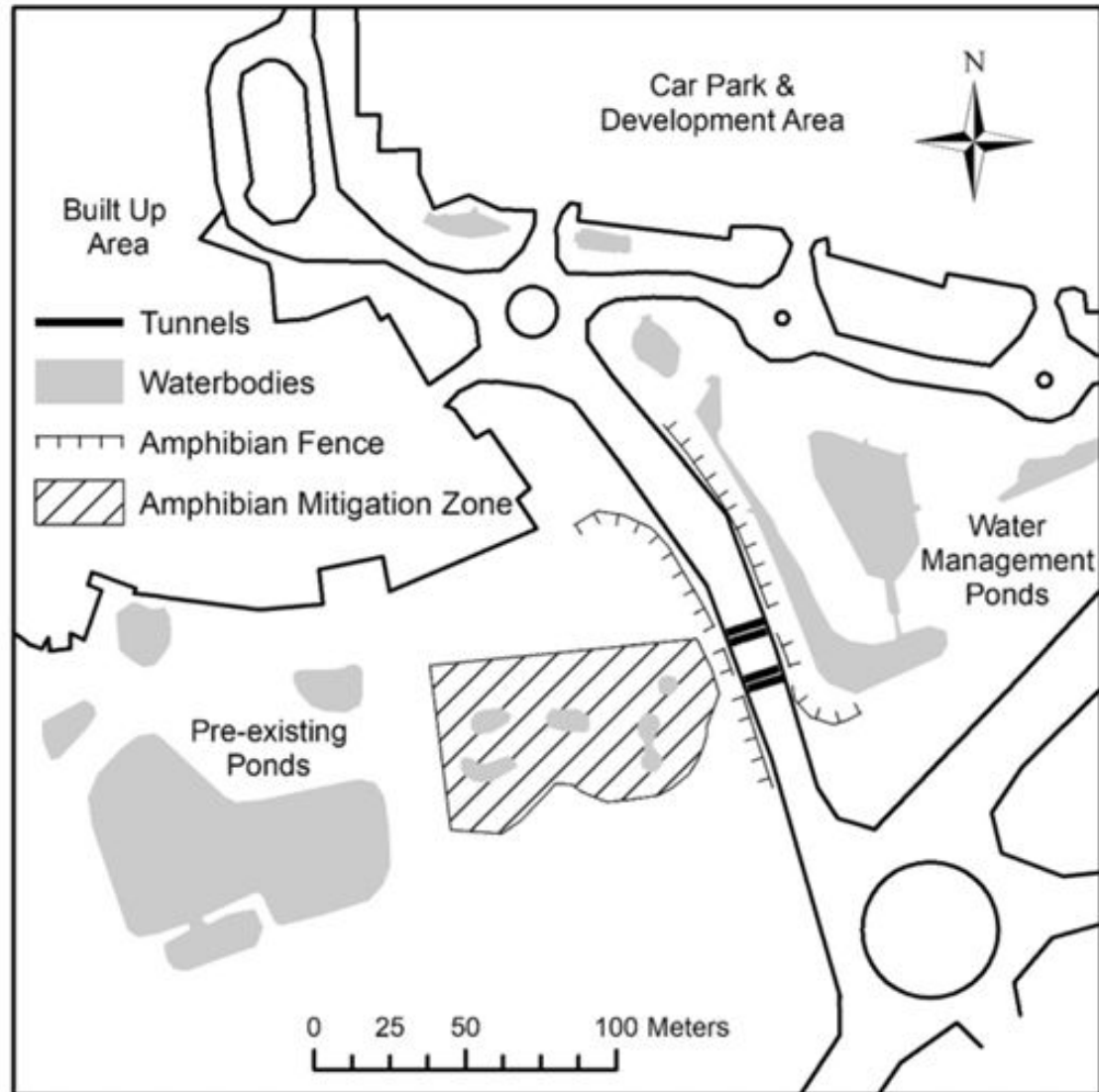
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Abstract

Habitat loss and fragmentation due to urbanisation and road developments have substantial impacts on amphibian populations and road mitigation measures are increasingly used in order to reduce such risks. However, numerous important questions remain unanswered on the actual effectiveness of such ecological road mitigation projects. We used specially adapted time-lapse recording cameras and a custom image analysis script to monitor the amphibian usage and effectiveness of a multi-tunnel



Great crested newt mitigation tunnels



Great crested newt mitigation tunnels



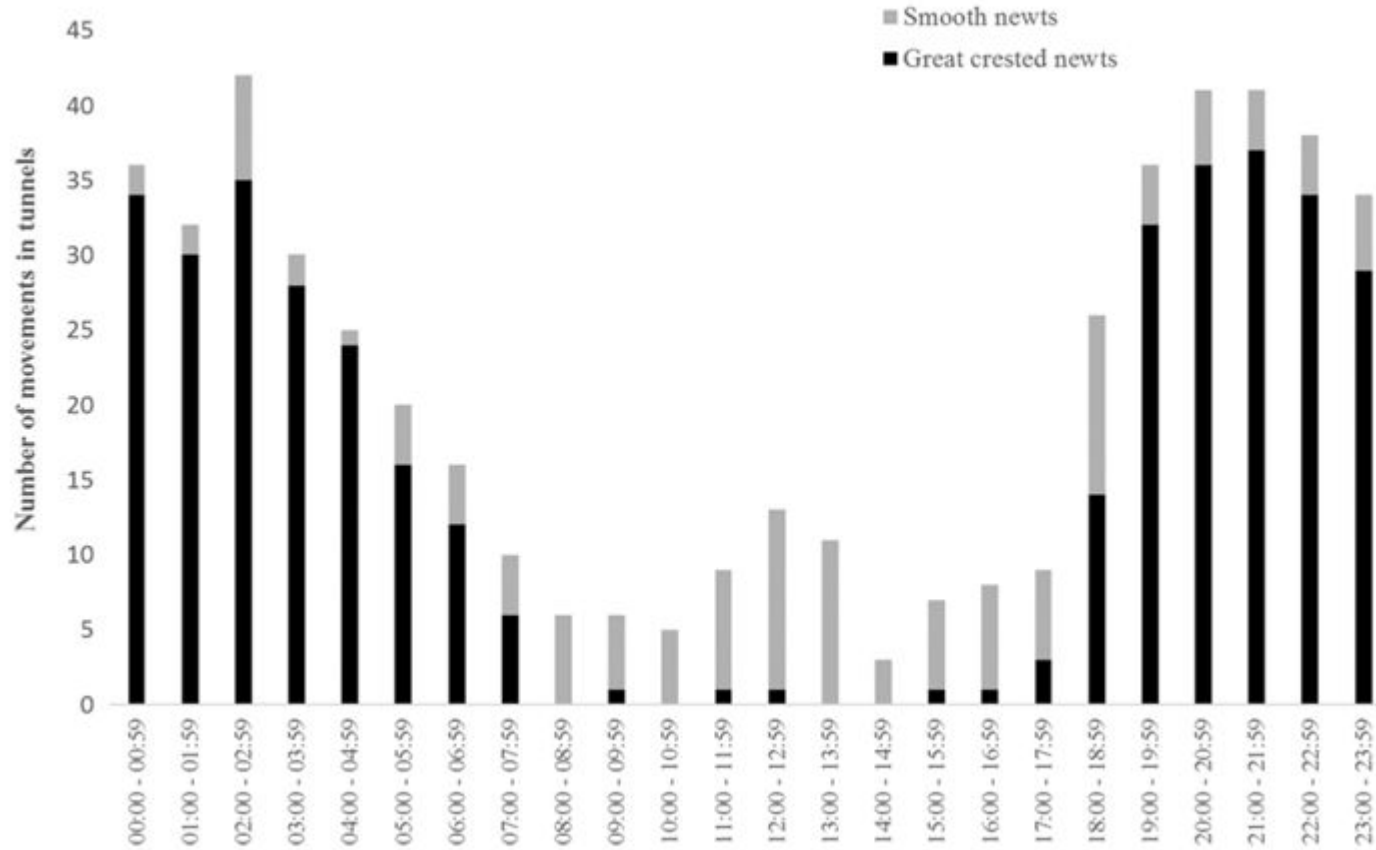
Great crested newt mitigation tunnels



Great crested newt mitigation tunnels



Great crested newt mitigation tunnels



Conservation of amphibian habitats





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